

# APPARATUS AND METHODS FOR HANDLING AND CONTROLLING THE NURTURING OF PLANTS

## ABSTRACT

Apparatus for handling and controlling the nurturing of plants comprises a greenhouse  
5 for providing a first environmental zone for nurturing plants, a plant warehouse for providing a  
second environmental zone for nurturing plants, transport rails extending from within the first  
environmental zone to within the second environmental zone, and a plurality of ebb and flood  
trays. The first environmental zone is located in the greenhouse in a region positioned to receive  
substantial amounts of sunlight. The second environmental zone is located in the warehouse in a  
10 region substantially sheltered from sunlight.

The ebb and flood trays each include a valve for controlling fluid flow into and out from  
a flood region within the tray. The valve includes means for receiving a fluid flow from an  
external source of fluid through a top end of the valve and, in response to the flow, for diverting  
the flow into the flood region of the tray. Further the valve includes means responsive to the  
15 absence of the flow for permitting fluid from the flood region to drain through a bottom end of  
the valve.

A method of handling and controlling the nurturing of plants in an ebb and flood tray  
includes the steps of maintaining first and second environmental zones for nurturing plants;  
maintaining transport rails extending from within the first environmental zone to within the  
20 second environmental zone, adapting the tray for riding movement on the rails, positioning the  
tray on the rails for such movement, and carrying the plants in the tray. The first zone is located  
in a structure in a region positioned to receive substantial amounts of sunlight. The second zone  
is located in a structure in a region substantially sheltered from sunlight. At a first time, and if a  
first prescribed condition is satisfied, the tray with the plants is moved along the rails from  
25 within the first environmental zone to within the second environmental zone. At a subsequent  
time, and if a second prescribed condition is satisfied, the tray with the plants is moved along the  
rails from within the second environmental zone to within the first environmental zone.